

***NATIONAL WEATHER SERVICE WESTERN REGION SUPPLEMENT 20-2003
TO INSTRUCTION 10-513
JANUARY 4, 2005***

***Operations and Services
Public Weather Services, NWSPD 10-5
WFO Winter Weather Products Specification, NWSI 10-513
WESTERN REGION WINTER WEATHER PRODUCTS***

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SUMMARY OF REVISIONS: This supplement supersedes Western Region Supplement 20-2003 to Instruction 10-513, dated December 31, 2003. Revisions include updates to Section 3 on winter weather criteria, especially definitions of winter products with more than one hazard; a substantial rewrite of standardized headline rules in section 4.2; and removal of most of the verification section which will become separate documentation.

Signed

12/27/04

Vickie Nadolski

Date

Director, Western Region

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1. Description. Hazardous winter weather is addressed by Western Region (WR) Weather Forecast Offices (WFOs) by issuing winter weather outlooks, watches, warnings, and advisories when conditions are expected to meet established criteria that pose a threat to people in the County Warning Area (CWA). Winter weather that does not meet hazardous criteria should be addressed in products such as the Short Term Forecast (AWIPS header NOW) or Special Weather Statement (AWIPS header SPS).

1.1 Forecaster Judgement. Written instructions cannot address every operational situation. All WFO personnel must exercise initiative and professional judgement to minimize risk to public safety and property in situations not explicitly covered by written instructions. Personnel must balance safety and needs of customers against frequency of warnings and possible constraint of travel and commerce. Protection of life and property shall take precedence in these decision making processes. As such criteria for winter storm warnings are considered guidance only, not strict thresholds. Forecasters may issued warnings based upon lower criteria if the event in question poses a significant threat to life due to timing or other circumstances. For example, an advisory would be appropriate for a minor snowfall event that takes place near rush hour, even if the amount may not meet strict criteria.

2. Products. Outlooks for potentially hazardous winter weather will be included in the daily Hazardous Weather Outlook (AWIPS header HWO). Outlooks can also be issued as separate Special Weather Statements (SPS) as stated in 10-513 section 3.2, but these statements should be reserved for major storms, big changes to the current weather pattern, and other circumstances in which the forecaster believes should receive heightened awareness of the upcoming storm.

Watches, warnings, and advisories for winter weather hazards are issued under the category WSW, and are referenced in the appropriate section of the HWO. Each of these products use the modernized site ID for the appropriate WFO in the AWIPS header. See <http://ww2.wrh.noaa.gov/public/WMOheaders/warningprods.htm> for a full list of WMO and AWIPS Ids for WR winter weather products.

2.1 Product Types and appropriate lead times.

- a. Outlooks. Outlooks are issued in the HWO for potential hazards which may develop in the Day 3-7 period of the forecast. An SPS (titled “Special Weather Statement” with a headline highlighting the upcoming storm) may be issued for events where significant hazards are possible as discussed above. It is appropriate to include non-warning/advisory conditions in the HWO if those conditions could pose a significant threat to the public if they are not prepared.
- b. Watches. Watches are issued when the risk of a hazardous weather event is significant in the 12 to 48 hour time frame, but occurrence, location, severity, and/or timing is uncertain. Watches may be issued beyond 48 hours for large synoptic scale storms, but care must be used so that we do not reduce the effectiveness of watches by issuing too many false alarms.

- c. Warnings. Warnings are issued when an event meeting established criteria is occurring, imminent, or has a significant probability of occurrence within 36 hours. Warnings may be issued beyond 36 hours for large synoptic scale storms, but care must be used so that we do not reduce the effectiveness of warnings by issuing too many false alarms.
- d. Advisories. Advisories are issued for certain events that have a significant probability of occurrence in the first 36 hours. These events are defined as non life-threatening by themselves, but they could become life-threatening if caution is not exercised.

2.2 Relationship to NPW. High wind watches/warnings and wind advisories will not be issued within WSWs. Issue all high wind watches/warnings/advisories as their own NPW product. Winter weather warnings/ advisories will not be combined with non-precipitation hazards in the NPW product at any time.

2.2.1 Combined wind and snow events. If strong winds will be in the same zones as winter precipitation that meets criteria, issue Blizzard/Winter Storm Warnings or Winter Weather Advisories rather than separate WSWs and NPWs.

2.3 Relationship to NOW. Both hazardous and non-hazardous winter weather may be addressed in the Short Term Forecast (NOW). When locally-established criteria for winter weather are met, NOWs should be issued to relay information for approximately the one to three hour time frame. When winter weather warnings or advisories are in effect, the appropriate headlines should be included in the NOW. NOWs should contain detailed information on timing and location (i.e., use “snow will end south of highway 224 by 7 pm” rather than “snow ending south this evening”).

3. Criteria. Criteria for winter weather watches/warnings/advisories will consider climatology and customer needs, and reflect a balance between public safety and too many false alarms. Customers, emergency management officials, concerned federal, state and local government agencies, the media, Western Region Headquarters (MSD), and all other appropriate groups must be aware of WFOs criteria for winter weather watches, warnings, and advisories. Awareness must be maintained with these local customers and partners awareness through regular outreach, and those groups with the most at stake should have input into the process of choosing criteria as it affects their operations.

The State Liaison Office MIC (SLOMIC) will coordinate all criteria with MICs of WFOs within his/her state to ensure consistency for climatologically similar areas, keeping in mind those separated by state or county borders. To aid the coordination of warning and advisory criteria in adjacent CWAs, WFOs will post their winter weather watch/warning/advisory criteria in their SDM on the MSD intranet site <http://sdm.wrh.noaa.gov>.

3.1 Heavy Snow. Climatic and topographic variability across the west make it difficult to establish relevant heavy snow criteria with consistent snow amount-elevation relationships. Western Region includes mountain ranges such as the Rockies, the Sierra Nevada, and the

Cascades which receive 500 or more inches of snow annually. In areas where snow is not common, such as in population centers at low elevations, public safety can be seriously impacted with even the slightest snow accumulation.

As a result, considerable flexibility is given to local WFOs to define heavy snow criteria within their County Warning Area (CWA). To avoid abrupt differences in heavy snow criteria between adjacent CWAs, MICs will coordinate their heavy snow criteria, and applicable elevation ranges, with the state liaison office (SLO) and neighboring WFOs. Some WFOs that have great differences in climate and topography across their areas may have many different heavy snow criteria throughout the CWA.

Taking into account the climatic and geographic variability described above, heavy snow criteria in Western Region will be defined as follows:

- a. Where snow is considered common, heavy snow criteria of four inches or more in 12 hours or six inches or more in 24 hours will be used as the basic criteria.
- b. Where greater snow accumulation is common (higher elevations or cold, wet climates) the MIC can establish higher thresholds to define heavy snow.
- c. In areas where snow is rare and/or causes a significant impact to public safety, transportation, and commerce, the MIC can establish lower thresholds to define heavy snow.

3.1.1 Snow Amount Forecasts. The decision to issue a warning should be based, in addition to the mid point value method listed in 10-513 section 5.2.2.2, on the average amount of snow expected to affect the majority or most relevant portion of the forecast area. In zones where the population is well dispersed and winter weather will have a similar effect across the entire zone, generally the midpoint of the expected snowfall may be used to determine whether to issue a warning. In zones where the population is mostly confined to a small area within the zone, also consider the effect the snow will have on the population when making the warning decision. In mountains, use the snow amount that will most affect passes, roads and people, rather than that expected to fall at a remote point on a peak. Forecasters must balance public safety and the frequency of warnings/advisories in determining whether the threat requires heightened attention.

3.1.2 Snow Advisory Criteria. MICs, in coordination with Emergency Management customers and adjacent WFOs, will determine and document local criteria governing the issuance of winter weather advisories. This can include the option NOT to issue certain types of advisories as deemed appropriate when considering climatology and other factors. WFOs will post their winter weather advisory criteria in their SDM on the MSD intranet site <http://sdm.wrh.noaa.gov>. See NWSI 10-513 section 6 for specific information on winter weather advisories.

3.2 Winter Storm and Blizzard Warnings. Winter Storm Warnings may be issued when two or more predominant hazards are expected during a storm, including snow, ice, sleet, and/or wind and blowing snow (below blizzard conditions). This includes heavy snow along with enough

wind to produce blowing and drifting snow, even if the wind itself does not meet warning criteria. The principal difference between a Blizzard Warning and a Winter Storm Warning for snow and wind is the visibility; a blizzard contains visibilities frequently below 1/4 mile for three hours or more. If only one predominant hazard is forecast, issue the appropriate warning as listed in 10-513, Section 5.2.2.1.

3.3 Winter Weather Advisories. Winter Weather Advisories may be issued when two or more predominant hazards are expected during a storm, including snow, ice, sleet, and/or wind and blowing snow. These advisories should be titled “WINTER WEATHER ADVISORY” with the details included in the text below; do not call them “WINTER WEATHER ADVISORY FOR SNOW AND BLOWING SNOW”, etc. If only one predominant hazard is expected, use the appropriate advisory as specified in 10-513, Section 6.2.2.1.

3.4 Watches. Winter weather watch criteria are the same as warning criteria. However, when an advisory is issued following a watch, do not use the words “downgraded” to describe the advisory.

3.5 Wind Chill. Dangerous wind chill is defined by NWS as the effective temperature (wind chill index, per WMO [2001]) at which the health and well being of people is put in serious jeopardy. The effective temperature is dependent on ambient air temperature, wind speed, and exposure. Wind chill warnings and advisories should include information on the time to frostbite at the predicted wind speeds and temperatures. A table of wind chill values is available in 10-513 Appendix B.

3.5.1 Wind Chill Warnings. Wind chill warnings will be issued when wind chill index temperatures are expected to drop below a locally determined effective temperature threshold (usually **-20°F to -40°F**) for more than one hour, with wind speed at least 10 mph. The exact criteria for both temperature and duration are set locally.

3.5.2 Wind Chill Advisories. Wind chill advisories are optional and criteria should be established locally. When establishing wind chill advisory criteria, consider the climatological range and frequency of combined wind and cold events that pose potential danger for unprepared citizens.

4. Product Format. WSWs are segmented products. Format details are well described in Instruction 10-513.

4.1 Overview. WSWs may include an optional overview section before the segments. The overview contains a general descriptive headline and synopsis of the event. It is placed before the segments, without UGC. Where prior state/local agreements require, they may be placed at the end of the WSW product.

4.2 Headlines. Until the Valid Time and Event Code (VTEC) is implemented in winter weather products, headlines will serve as a means of determining the appropriate dissemination of winter weather information for our national partners. Because of this, headline standardization

is extremely important and policy must be followed at all times. The basic rules for headline standardization are as follows:

a. The *hazard type, or product name*, must be one of the listed products in 10-513, Sections 4.2.2.1, 5.2.2.1, or 6.2.2.1. Do not use WINTER STORM WARNING or WINTER WEATHER ADVISORY if only one hazard is expected to occur.

b. The *action code* (IN EFFECT, EXTENDED, IS CANCELED, etc.) will match those shown in 10-513, Sections 4.3.4.2, 5.3.4.2, or 6.3.4.2.

The phrase “HAS BEEN ISSUED” is not used; use “IN EFFECT”.

The phrase “UPGRADED” is not used; instead, use a single headline stating the new warning is IN EFFECT.

The phrase “DOWNGRADED” is not used. Instead, two headlines are used; one stating the first product has been CANCELED, and a second headline stating the new product is IN EFFECT.

c. The *time phrases* must match those shown in 10-513, appendix C. In summary, Warnings and Advisories must use a specific beginning and ending time and day (e.g., ...FROM 6 AM THIS MORNING TO 9 AM MST TUESDAY MORNING...); Watches must use a general time and day phrase (e.g., ...FROM SUNDAY MORNING THROUGH MONDAY AFTERNOON...).

d. *Additional Information.* WR WFOs are allowed a few options within the national policy (10-513, Section 5.3.4.2) in order to meet local customer requirements.

i. Elevation: WR WFOs may include elevation in the headline as necessary. If used, elevation information will be included at the end of the headline. (e.g., “...HEAVY SNOW WARNING IN EFFECT UNTIL 6 AM TUESDAY ABOVE 7000 FEET...”).

ii. Area: To meet local customer requirements, an areal descriptive term may be included as long as it is placed at the end of the headline. (e.g., “...ICE STORM WARNING REMAINS IN EFFECT UNTIL 10 PM FRIDAY FOR THE COLUMBIA GORGE...”)

4.2.1 Expiration Statements. Though not specifically addressed in 10-513, WR WFOs are encouraged to issue a final statement when a warning or advisory has reached its normal expiration time and has not been previously canceled. A short statement should be issued near the expiration time with the headline “THE _____ WARNING/ADVISORY WILL EXPIRE AT _____. This provides customers with a final notification that the event is indeed over.

4.3 Segment Content. Within each segment the free text description of the event will be concise and restricted to addressing the specifics of the weather that is expected. Where appropriate, include mention of specific highways or other geographic locations where the public would be especially vulnerable. A definition of watch/warning must be included as shown in 10-513 sections 4.3.4.2.b and 5.3.4.2.b if the event has not yet begun. Attribution statements (THE

NATIONAL WEATHER SERVICE IN [WFO LOCATION] HAS ISSUED A...) are required for the first issuance of a particular watch/warning/advisory; see 10-513 sections 4.3.4.2.b.1, 5.3.4.2.b.1 and 6.3.4.2.b.1.

4.3.1 Call-to-Action Statements. Concise call-to-action statements should be included in each segment if the statements relay extremely urgent messages, such as potentially life-saving actions. Other less urgent call-to-action statements may be included in one of three ways: either separated from other content within a segment by using the && separator; included as part of the overview; or grouped together after the \$\$ ending the final segment of the product. WFOs must remember that call-to-action statements not included in the segments will not be received by customers who program their systems to only receive their local segments.

5. Verification. Verification statistics for winter storm events will be kept by each WFO. Verification should be performed in a timely manner during/after each warning/advisory event. Maintaining a good working relationship with state and local Departments of Transportation/Highways, Law Enforcement Officials, and other groups will help WFOs gather snowfall data during and after events. WFOs are encouraged to contact these reliable sources during and shortly after events, in addition to receiving reports from trained spotters and dependable automated equipment. Subjective judgement, common sense, and honesty will be the guiding factors in determining both the occurrence of winter storm events and lead times. The final determination resides with the WFO MIC as to how a storm verified or whether an event occurred.

Verification statistics should be entered into the appropriate regional database as required in other WR Supplements and policies.

APPENDIX A

See also the examples contained in Appendix A of NWSI 10-513.

Example 1:

WWUS46 KSLC 090300
WSWSLC

URGENT - WINTER WEATHER MESSAGE
NATIONAL WEATHER SERVICE SALT LAKE CITY UT
800 PM MST WED DEC 8 2004

.A MOIST PACIFIC STORM SYSTEM WILL AFFECT SOUTHERN IDAHO...
NORTHERN UTAH...AND SOUTHWESTERN WYOMING THROUGH EARLY THURSDAY.

ANYONE TRAVELING THROUGH THE NORTHERN UTAH MOUNTAINS AND MOUNTAIN
VALLEYS AND IN EXTREME SOUTHWEST WYOMING SHOULD BE PREPARED FOR
SEVERE WINTER DRIVING CONDITIONS.

IDZ025-UTZ007>009-091300-
WASATCH MOUNTAINS I-80 NORTH-WASATCH MOUNTAINS SOUTH OF I-80-
WASATCH MOUNTAINS/IDAHO PORTION-WESTERN UINTA MOUNTAINS-
800 PM MST WED DEC 8 2004

...WINTER STORM WARNING REMAINS IN EFFECT UNTIL 11 AM MST
THURSDAY...

A WINTER STORM WARNING REMAINS IN EFFECT THROUGH THURSDAY MORNING
FOR THE WASATCH MOUNTAINS OF SOUTHEAST IDAHO AND NORTHERN UTAH
AND THE WESTERN UINTA MOUNTAINS.

ADDITIONAL ACCUMULATIONS TONIGHT AND THURSDAY MORNING WILL RANGE
FROM 7-10 INCHES IN THE BEAR RIVER VALLEY AND UP TO 16 INCHES AT
THE HIGHER ELEVATIONS IN THE NORTHERN WASATCH MOUNTAINS AND THE
UINTA MOUNTAINS. IN THE SOUTHERN WASATCH MOUNTAINS ADDITIONAL
ACCUMULATIONS ARE EXPECTED TO RANGE FROM 12-22 INCHES.

SNOW...FREQUENTLY HEAVY...WILL CONTINUE THROUGH THURSDAY MORNING.
IN ADDITION SOUTHWEST WINDS OF 30-40 MPH WITH GUSTS OVER 60 MPH
WILL CONTINUE TONIGHT AS THE DIRECTION SLOWLY SHIFTS THROUGH WEST
TO NORTHWEST BY THURSDAY MORNING. THESE WINDS CAUSE LOW
VISIBILITIES AND WIDESPREAD BLOWING AND DRIFTING SNOW.

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WYZ021-091300-
SOUTHWEST WYOMING-
800 PM MST WED DEC 8 2004

...WINTER STORM WARNING REMAINS IN EFFECT UNTIL 11 AM MST
THURSDAY...

A WINTER STORM WARNING FOR UINTA COUNTY IN EXTREME SOUTHWESTERN
WYOMING REMAINS IN EFFECT THROUGH THURSDAY MORNING.

ADDITIONAL ACCUMULATIONS BY THURSDAY MORNING WILL RANGE FROM 3-9
INCHES WITH LOCALLY GREATER AMOUNTS AT THE HIGHER ELEVATIONS.

SNOW WILL CONTINUE...HEAVY AT TIMES...THROUGH THURSDAY MORNING.
IN ADDITION...SOUTHWEST WINDS OF 25-35 MPH WITH GUSTS OVER 45 MPH
WILL CONTINUE THROUGH THE NIGHT WITH THE WINDS SHIFTING TO THE
WEST. THESE WINDS WILL CAUSE NEAR BLIZZARD CONDITIONS WITH
BLOWING AND DRIFTING SNOW ALONG WITH AREAS OF LOW VISIBILITY.

\$\$

UTZ006-091300-
WASATCH MOUNTAIN VALLEYS-
800 PM MST WED DEC 8 2004

...SNOW AND BLOWING SNOW ADVISORY REMAINS IN EFFECT UNTIL 11 AM
MST THURSDAY...

A SNOW AND BLOWING SNOW ADVISORY REMAINS IN EFFECT FOR THE
WASATCH MOUNTAIN VALLEYS OF NORTHERN UTAH THROUGH 11 AM THURSDAY
MORNING.

SNOW WILL CONTINUE TONIGHT WITH ADDITIONAL ACCUMULATIONS OF 3-6
INCHES EXPECTED.

IN ADDITION WINDS OF 15-30 MPH WITH GUSTS TO 50 MPH WILL CONTINUE
IN MANY AREAS. THIS WILL CAUSE WIDESPREAD BLOWING AND DRIFTING
OF THE SNOW ALONG WITH AREAS OF EXTREMELY LOW VISIBILITY.

THE SNOW EXPECTED TO BECOME LIGHT THURSDAY MORNING WITH LITTLE
ADDITIONAL ACCUMULATIONS...BUT STRONG GUSTY WINDS ARE EXPECTED TO
CONTINUE TO CAUSE BLOWING AND DRIFTING CONDITIONS.

\$\$

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UTZ012-091300-
CASTLE COUNTRY-
800 PM MST WED DEC 8 2004

...SNOW ADVISORY IN EFFECT UNTIL 3 AM MST THURSDAY...

THE NATIONAL WEATHER SERVICE IN SALT LAKE CITY HAS ISSUED A SNOW ADVISORY FOR PRICE AND CASTLE EFFECTIVE THROUGH 3 AM THURSDAY MORNING.

SNOW...HEAVY AT TIMES...WILL CONTINUE THIS EVENING THEN TAPER OFF AFTER MIDNIGHT TONIGHT. THE HEAVIEST SNOW WILL BE IN WESTERN CARBON COUNTY WHERE AN ADDITIONAL 2-4 INCHES IS EXPECTED.

\$\$

Example 2:

WWUS45 KREV 081859
WSWREV

URGENT - WINTER WEATHER MESSAGE
NATIONAL WEATHER SERVICE RENO NV
1058 AM PST WED DEC 8 2004

CAZ071-081929-
LASSEN-EASTERN PLUMAS-EASTERN SIERRA COUNTIES
1058 AM PST WED DEC 8 2004

...BLIZZARD WARNING IS CANCELLED...

THE BLIZZARD WARNING FOR ELEVATIONS ABOVE 6000 FEET HAS BEEN CANCELLED.

SNOW DECREASED CONSIDERABLY ACROSS THE AREA. STRONG WINDS WILL STILL PRODUCE AREAS OF LOW VISIBILITIES THIS AFTERNOON BEFORE TAPERING OFF THIS EVENING.

\$\$

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CAZ072-NVZ002-081939-
GREATER LAKE TAHOE AREA-
1058 AM PST WED DEC 8 2004

...BLIZZARD WARNING IS CANCELLED...
...SNOW AND BLOWING SNOW ADVISORY IN EFFECT UNTIL 6 AM PST
THURSDAY...

THE BLIZZARD WARNING HAS BEEN DOWNGRADED TO A SNOW AND BLOWING
SNOW ADVISORY.

SNOW HAS DECREASED CONSIDERABLY IN THE SIERRA LATE THIS MORNING.
STRONG GUSTY WINDS CONTINUE TO PRODUCE AREAS OF VISIBILITIES
BELOW 1/4 MILE...MAINLY AT UPPER ELEVATIONS AND PASSES.

ADDITIONAL SNOW ACCUMULATIONS OF 3 TO 5 INCHES ABOVE 7000 FEET
ARE EXPECTED THIS AFTERNOON. IF YOU MUST TRAVEL THROUGH THE
SIERRA TODAY...MAKE SURE YOU CARRY A WINTER SURVIVAL KIT.

\$\$

Example 3:

WWUS45 KMSO 101947
WSWMSO

URGENT - WINTER WEATHER MESSAGE
NATIONAL WEATHER SERVICE MISSOULA MT
1246 PM MST FRI DEC 10 2004

MTZ002-102030-
WEST GLACIER REGION-
INCLUDING...SWAN LAKE
1246 PM MST FRI DEC 10 2004

...SNOW ADVISORY HAS EXPIRED FOR THE WEST GLACIER REGION...

TEMPERATURES AND SNOW LEVEL CONTINUE TO RISE FOR THE WEST GLACIER
REGION. SOME LIGHT SHOWERS ARE VISIBLE ON RADAR AND MOST
STATIONS ARE REPORTING RAIN AT THIS TIME. THEREFORE THE SNOW
ADVISORY HAS BEEN ALLOWED TO EXPIRE.

MOTORISTS SHOULD CONTINUE TO USE CAUTION AND REDUCE SPEED AD
ROADS REMAIN SLUSH COVERED.

\$\$